**NEWS ARTICLE**

AECOM commended at CESA Aon Engineering Excellence Awards 2023 for ABSA Zambia Head Office

**2 October 2023:** Globally trusted infrastructure consulting firm [AECOM](http://www.aecom.com) received a commendation in the category for Best International Project of the Year for the ABSA Zambia Head Office at the CESA Aon Engineering Excellence Awards 2023 which was held on 16 August at Vodacom World in Midrand.

The 6 739 m² Zambian head office is the new home for ABSA’s Africanacity drive in Lusaka. Officially opened by **His Excellency President Hakainde Hichilema** on 23 March 2023, the building has become a new landmark and set a new standard for office buildings in the city. **Dr. Denny H. Kalyalya**, Governor of the Bank of Zambia, commented it was a flagship development for major investment in Zambia.

The project comprised the main building, a plant farm building, a gatehouse building, staff parking and an upgrade of the external Kelvin Siwale access road. It was planned, designed and constructed by a multinational team on a geotechnically challenging site 4.3 km north-east of the Lusaka city centre.

**Ross Dold**, Senior Geotechnical Engineer at AECOM, explains that, due to the ground conditions, the site was classified as a designation D3 dolomite site due to its Inherent Hazard Class (IHC) 5, according to SANS 1936. Dolomite is a sedimentary carbonate-based rock including minerals that degrade in acidic conditions, which can be caused by ingress of slightly acidic rainwater.

This reaction causes the rock to break down, resulting in low-strength, unpredictable materials and potentially underground cavities. It can result in the development of sinkholes or subsidence. The D3 and IHC 5 classifications for the site required that the building structures be designed for a potential loss of ground support of 5 m diameter at any location. **Grace Mpai**, who started out as a Senior Technologist on the project and progressed to Lead Structural Designer, adds that Dold and his team engaged with the ground conditions from an early stage.

While Zambia does not have a specific dolomite building code, the well-written South African national standard was adopted for the project, adds Dold. “We had two contractors who had never worked in dolomitic conditions before and were not anticipating quite how stringent those measures were, which was one of the challenges we had to deal with.”

Another issue was the water drawdown in dolomite, with AECOM having to carefully manage the use of borehole water as a sustainability measure. “It was important for us to convey that the measures we implemented would guarantee the safety and longevity of the project,” says Dold.

In addition, all sewer and stormwater services within 5 m of the building perimeter were reticulated in double encased high-density polyethylene (HDPE) pipes to ensure that unidentified water leaks do not penetrate the ground directly adjacent to the building.

The site lies about 500 mm below the access road levels on an existing flood plain. A 2.25 m building platform, comprising 1.5 m of engineering fill and a 750 mm reinforced concrete raft raised the building above the flood lines and provided the uniform stiff layer of soil material for the building to be founded on. This mitigated the potential risk of loss of natural ground support.

The team worked together to deliver a quality project that achieved the client’s expectations. To meet this goal, the latest design and collaboration software was used. Autodesk Revit was used for the infrastructure modelling and 3D coordination of all services. Rigorous coordination was implemented during the design stages with the aid of Autodesk Navisworks to minimise clashes on-site during construction. As part of this process, weekly clash detection meetings were scheduled to resolve any clashes identified.

The project was delivered by using the latest design software packages, with full 3D coordination of all services as well as a thorough technical quality review process. Autodesk BIM360 was used for the document management system and Holobuilder for construction progress management using it’s reality capture capabilities.

“It definitely helped a lot because we had a group of people working on one consolidated model. We could all look at what was happening,” says **Xolani Mandidi**, who was responsible for the civil engineering design and progressed to Engineering Design Manager during the project. His design role included earthworks to subsurface infrastructure.

“Dealing with a diversity of personalities and cultures on one project and trying to incorporate everyone’s vision was not easy, but we did our best and ended up with a highly successful project,” says Mandidi. A challenge was to merge the different working cultures of the South African and Zambian contingent and, in effect, find a common ground between the local expertise and AECOM’s own design and engineering input.

Mpai says another challenge presented itself when the team discovered that certain products or materials specified were unavailable in Zambia. However, thanks to innovative design solutions, such hurdles were overcome. The project was also built to green building standards, with a particular low-carbon initiative being to incorporate 35% locally sourced fly ash in the concrete.

The mechanical engineering team also managed to incorporate a lot of sustainability elements. A climate control system is managed by the building’s fully integrated building management system (BMS). The air-conditioning system is zoned to allow the system to respond to the particular cooling or heating requirements of a given space, and to ensure that only the required cooling or heating is provided.

The electrical system is critical to the bank’s operations, especially because Zambia has a history of load shedding. The building’s critical connections are connected via the UPS system and are backed up by two 630 kVA generators to ensure constant electrical supply. Even given the various technical and logistical challenges encountered, the project costs remained within the client’s budget.

Given the large quantity of glazed fenestration, perimeter air-conditioning zones were also defined to treat the majority of the incident heat as close as possible to the façade. This system increases occupant comfort and decreases temperature variations in the inner spaces which, in turn, results in a more stable load on the air-conditioning system.

The partnership of Turner & Townsend (South Africa) and Profica (Zambia) comprised the project management team. In addition to the overall project management team, an internal Engineering Design Manager from AECOM led and managed the engineering consulting team.

During construction, AECOM and BCHOD and NAEC engineers had standing weekly technical meetings to discuss technical design matters. These meetings facilitated the transfer of skills and enabled BCHOD/NAEC to provide local contextual design knowledge.

With its colourful, piano-inspired façade, high-end finishes and state-of-the-art technology, the ABSA Zambia head office is paving the way for the ABSA of the future. To maintain the aesthetics of the building, the engineering team followed the lead and worked closely with the architecture team to ensure that the engineering elements reflected the envisioned look and feel of the building.

The consulting engineering teams were deeply involved with the implementation and construction of the project. After the dolomite stability investigation had established the conditions and quality of material underlying the site, the geotechnical engineering team recommended that the building be moved 70 m from its proposed location, which was directly above the area of highest risk, to a portion of the site with less susceptivity to subsidence. This recommendation was incorporated on the project, reducing costs as well as construction timelines.

The AECOM team consulted regularly with BCHOD and NAEC for the local applicability of proposed designs to ensure that what was being specified could be constructed safely and within reasonable costs locally and achieving regulatory compliance. ABSA’s mandate for the project was to create a new landmark building in Lusaka. To achieve this goal, the consultants worked closely with ABSA to create a flagship development:

**Professional Team**

* **Client**: ABSA
* **Architect**: Boogertman & Partners (South Africa) and Timestone Architects (Zambia)
* **Principal Agent and Project Manager**: Turner & Townsend (South Africa) and Profica Management (Zambia)
* **Civil, Geotechnical and Structural Engineer**: AECOM (South Africa) and Brian Colquhoun, Hugh O’Donnell and Partners – BCHOD (Zambia)
* **Electrical, Mechanical, Wet and Fire Engineer**: AECOM (South Africa) and North Atlantic Engineering Consultants – NAEC (Zambia)
* **Quantity Surveyor**: AECOM (South Africa) and MLN Associates (Zambia)
* **Main Contractor**: Sunshare Construction (China and Zambia)

***Ends***

**Notes to the editor**

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